

# **Rubber Asphalt Binder "Stress Absorbing Membrane Interlayer"**

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SR 12, Contract 1083

Morton to Packwood

and

SR 12, Contract 0937

Jackson Highway to Beach Road

WA-RD 185.1

Final Evaluation Report

March 1989



**Washington State Department of Transportation**  
Planning, Research and Public Transportation Division

in cooperation with the  
United States Department of Transportation  
Federal Highway Administration

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16. ABSTRACT  Experimental installation of rubber-asphalt binder stress absorbing membrane interlayers were evaluated for their ability to delay or prevent reflective alligator cracking. The final results are inconclusive in that after 10 years of service life neither the control sections paved without an interlayer or the remainder of the projects paved with the interlayer have shown any reflective alligator cracking. It is suspected that the thickness of the overlay in combination with the sound structure of the underlying pavement has masked any of the benefits of the interlayer.			
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RUBBER ASPHALT BINDER  
"STRESS ABSORBING MEMBRANE INTERLAYER"

SR-12, Contract 1083  
Morton to Packwood

by  
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Special Projects Section

Experimental Feature WA78-07  
Final Evaluation Report

Prepared for  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
and in cooperation with  
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

March, 1989

## FINAL REPORT

Experimental Project WA 78-07

### **RUBBER-ASPHALT BINDER - "SAMI"**

#### Summary

An experimental installation of rubber-asphalt was placed as a stress absorbing membrane interlayer (SAMI) on two sections of SR-12 in the Morton vicinity. The total length of the two sections is approximately 3.5 miles.

The existing roadway was constructed in 1967 and 1968 and consisted of 0.25 ft of ACP over 0.92 ft of untreated gravel surfacing. It had experienced severe alligator cracking of the ACP in the wheel paths. The distress appeared to be due to simple fatigue cracking of a fairly thin section of ACP under heavy traffic conditions. The total surfacing depth was adequate to protect the subgrade soil.

The roadway sections as designed for this project follows:

#### Section 1 MP 96.91 to MP 98.00

0.15 ft	ACP Class B
SAMI	Rubber-Asphalt
<u>0.05 ft</u>	ACP Class G for prelevel
0.20 ft	Min. Total Depth

#### Section 2 MP 102.03 to MP 104.41

*0.15 ft	ACP Class B
SAMI	Rubber-Asphalt
<u>0.05 ft</u>	ACP Class G for prelevel
0.20 ft	Min. Total Depth

\*0.25 ft ACP Class B between MP 102.95 & MP 103.60

The rubber-asphalt was placed by Sealant Systems, Inc., which was the subcontractor for Lakeside Industries of Centralia, the prime contractor for the project. The rubber-asphalt system used on this project was supplied by Arizona Refining Co. of Phoenix, Arizona. The rubber-asphalt consisted of AR-4000W asphalt, reclaimed rubber Grade G274 supplied by U.S. Rubber Reclaiming Co., Inc., and Califlux G.P. diluent. The diluent and reclaimed rubber were added to the asphalt in an 8000 gallon mixing tanker which was at a temperature of 350 to 400 degrees F. The diluent, rubber, and asphalt were mixed together and heated to 425 degrees F in the large mixing tanker before being transferred to a 3800 gallon distributors for application.

Between MP 97.790 and MP 97.866, a 400 foot control section was constructed in which the rubber-asphalt SAMI was omitted in the westbound lanes. The performance of the adjacent pavement with the rubber-asphalt SAMI was compared to this section.

The SAMI was incorporated in this resurfacing project in an attempt to prevent, or at least reduce, reflective cracking. This project was monitored at regular intervals from the date of installation, July 18, 1978, to February 13, 1989, to evaluate the performance of the rubber-asphalt SAMI.

### Conclusions

To date, reflective alligator cracking has appeared in neither the SAMI test section nor the adjacent control section. There is some minor longitudinal cracking. No conclusion can be made from this project at this time regarding the effectiveness of the SAMI for reflective crack prevention or reduction. After 10 years service with no distress evident in either the control or test areas, we can only conclude that either the overlay depth was sufficient to mask the benefits of the interlayer or that the interlayer provided no benefits. Considering the overlay depth and the structure of the existing pavements we believe the overlay depth masked the effects of the interlayer.

RUBBER ASPHALT BINDER  
"STRESS ABSORBING MEMBRANE INTERLAYER"

SR-12, Contract 0937  
Jackson Highway to Beach Road

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Experimental Feature WA78-06  
Final Evaluation Report

Prepared for  
WASHINGTON STATE DEPARTMENT OF TRANSPORTATION  
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FEDERAL HIGHWAY ADMINISTRATION

March, 1989

## FINAL REPORT

Experimental Project WA 78-06

### **RUBBER-ASPHALT BINDER - "SAMI"**

#### Summary

An experimental installation of rubber-asphalt was placed as a stress absorbing membrane interlayer (SAMI) on approximately 8.5 miles of SR-12 between Mary's Corner and the town of Salkum in Lewis County, east of SR-5.

The existing roadway consisted of an old PCC pavement which was widened using cement treated base, then resurfaced with five inches of crushed surfacing and three inches of asphalt concrete between 1956 and 1958. The pavement had experienced considerable fatigue distress in the form of alligator cracking which had progressed to the stage where there was continuous alligator cracking throughout the project. Minor transverse cracking was also evident in some areas, reflecting the underlying PCCP joint pattern.

Resurfacing consisted of placing a rubber-asphalt SAMI over the traveled lanes, followed by a shoulder to shoulder overlay with 0.15 ft ACP Class B. Some nominal preleveling was accomplished with ACP Class G prior to the application of the rubber-asphalt.

The rubber-asphalt was placed by Sealant Systems, Inc. which was the subcontractor for Lakeside Industries of Centralia, the prime contractor for the project. The rubber-asphalt system used on this project was supplied by Arizona Refining Co. of Phoenix, Arizona. The rubber-asphalt consisted of AR-4000W asphalt, reclaimed rubber Grade G274 supplied by U.S. Rubber Reclaiming Co., Inc., and Califlux G.P. diluent. The diluent and reclaimed rubber were added to the asphalt in an 8000 gallon mixing tanker which was at a temperature of 350 to 400 degrees F. The diluent, rubber, and asphalt were mixed together and heated to 425 degrees F in the large mixing tanker before being transferred to a 3800 gallon distributors for application.

Between MP 69.39 and MP 69.45, a 300 foot control section was constructed in which the rubber-asphalt SAMI was omitted in the westbound lanes. The performance of the adjacent pavement with the rubber-asphalt SAMI was compared to this section.

The SAMI was incorporated in this resurfacing project in an attempt to prevent, or at least reduce, reflective cracking. This project was monitored at regular intervals from the date of installation, July 1978, to February 1989, to evaluate the performance of the rubber-asphalt SAMI.

### Conclusions

To date, reflective alligator cracking has appeared in neither the SAMI test section nor the adjacent control section. Some traverse cracking was observed, mainly in the westbound lane, between MP 71 and MP 72. No conclusion can be made from this project at this time regarding the effectiveness of the SAMI for reflective crack prevention or reduction. After 10 years service with no distress evident in either the control or test areas, we can only conclude that either the overlay depth was sufficient to mask the benefits of the interlayer or that the interlayer provided no benefits. Considering the overlay depth and the structure of the existing pavements we believe the overlay depth masked the effects of the interlayer.